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PREFACE

This document is the Aylmer District Fisheries Management Plan. It was prepared within the context of the Aylmer District Land Use Guidelines (DLUG, 1983). The Plan reflects public comment on: available fisheries information, management issues and problems, as well as the strategies and tactics selected for management of the District's fisheries resource.

The purpose of the Plan is to state long and short term fisheries management objectives and show how these will be implemented by the year 2000. It contains specific resource information, management strategies and tactics, and an initial five year implementation schedule.

Public consultation was an essential component of the process leading to the preparation of this resource management plan. The Aylmer District recognizes that certain issues may require further public consultation before specific management activities may be implemented and that this can be done without compromising the fundamental principles supporting this plan.

The Plan is designed to guide local fisheries managers. It also provides a measure against which the fisheries management program in the Aylmer District can be evaluated both internally and by the public.

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1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this District Fisheries Management Plan (DFMP) is to identify long term fisheries management activities which the Ontario Ministry of Natural Resources (MNR) will undertake to achieve fisheries objectives for the Aylmer District by the year 2000. These will be initiated over the short term as outlined in the first of a series of five year implementation schedules.

1.2 PLANNING PROCESS

The DFMP is consistent with a number of earlier planning exercises. For example, Ontario's broad management principles, goals and objectives for fisheries management flow from the work of a Federal-Provincial Committee that was established to assess and recommend strategies for managing Ontario Fisheries in the 1980's. The Committee's findings were summarized in a series of reports which precipitated the 'Strategic Planning for Ontario Fisheries for the 1980's', or SPOF initiative.

MNR's guiding framework for fisheries planning in Southern Ontario was provided in the Southern Ontario Coordinated Program Strategy (SOCPS) report. Published in 1982, this report established the broad goal and fisheries objectives for Southern Ontario.

Following the SOCPS policy direction, MNR published its Aylmer District Land Use Guidelines (DLUG) in 1983 after public review. These Guidelines provided locally refined fisheries targets and strategies to be used by the Aylmer District to meet its SOCPS objectives by the year 2000.

The DFMP and the planning context in which it was developed were outlined in the Ministry's 1986 report, 'A Framework for Resource Management Planning'. That report recommended that public input be obtained in the planning process and that programs and activities be integrated so that targets and objectives could be achieved more efficiently.

Lake Erie was included in the District's fisheries planning process. Lake Erie's fish are shared territorially by Canada and the United States, and are managed cooperatively by the international Great Lakes Fishery Commission (GLFC) of which Ontario is a member. Policy directions for Lake Erie fisheries were provided in the 1980 GLFC report, 'Joint Strategic Plan for Management of Great Lakes Fisheries.' This report provided a framework for the draft 'Lake Erie Fish Community Goal and Objectives' (GLFC 1988). Ontario's draft 'Lake Erie Strategic Fisheries Management Plan' (OMNR 1977) provides direction for lake-wide fisheries assessment and research as administered through the Lake Erie Fisheries Station at Wheatley. Management of the lake's sport and commercial fisheries is divided among MNR's Chatham, Aylmer, Simcoe and Niagara districts. The Aylmer DFMP considers the lake-wide management strategies set forth by the GLFC.

The fish resource in the Aylmer District is also influenced by management activities on Lake St. Clair and Lake Huron because migratory fish stocks from these waters move into Aylmer District rivers and provide seasonal fishing opportunities.

Enforcement is a vital fisheries management tool. The District's Law Enforcement Plan (Punshon 1985) outlines the enforcement effort necessary to achieve district resource use targets and objectives as outlined in the DLUG.

1.3 EXISTING POLICY AND TECHNICAL DIRECTION

The DFMP is supported by separate reference and technical documents that summarize and highlight the results of many studies and planning activities. These are filed at the Aylmer District Office and include:

(i) Terms of Reference (1986) - outlines the planning process and provides a timetable for the completion of each planning stage.

(ii) Background Information (1986) - provides a detailed report of resource availability, current and projected resource use, fisheries problems and issues, and current fisheries management practices.

(iii) Background Information and Optional Management Strategies and Tactics: A Summary (1986) - summarizes for public review the background information report by highlighting problems and issues. It also presents optional fisheries management strategies.

(iv) Analysis of Public Input to the Summary Report (1987) - evaluates public comments on the previous report from the first series of open house presentations.

(v) Draft Aylmer District Fisheries Management Plan (1987) - identifies in tabloid form long-term targets, selected management strategies and tactics and fisheries management designations for local waters.

(vi) Analysis of Public Input to the draft Fisheries Management Plan - evaluates public comments on the draft Plan from the second series of open houses.

2.0 DISTRICT FISHERIES PERSPECTIVE

2.1 PHYSICAL CONDITIONS

Aylmer District is one of five MNR Districts located in the Southwestern Region (Figure 1). The District includes Elgin, Middlesex and most of Oxford counties; the township of Norwich and the portion of the Township of Blandford-Blenheim east of Oxford Road No. 22 being excluded from the latter (Figure 2). The District boundary also extends to the international boundary between Canada and the United States of America on Lake Erie.

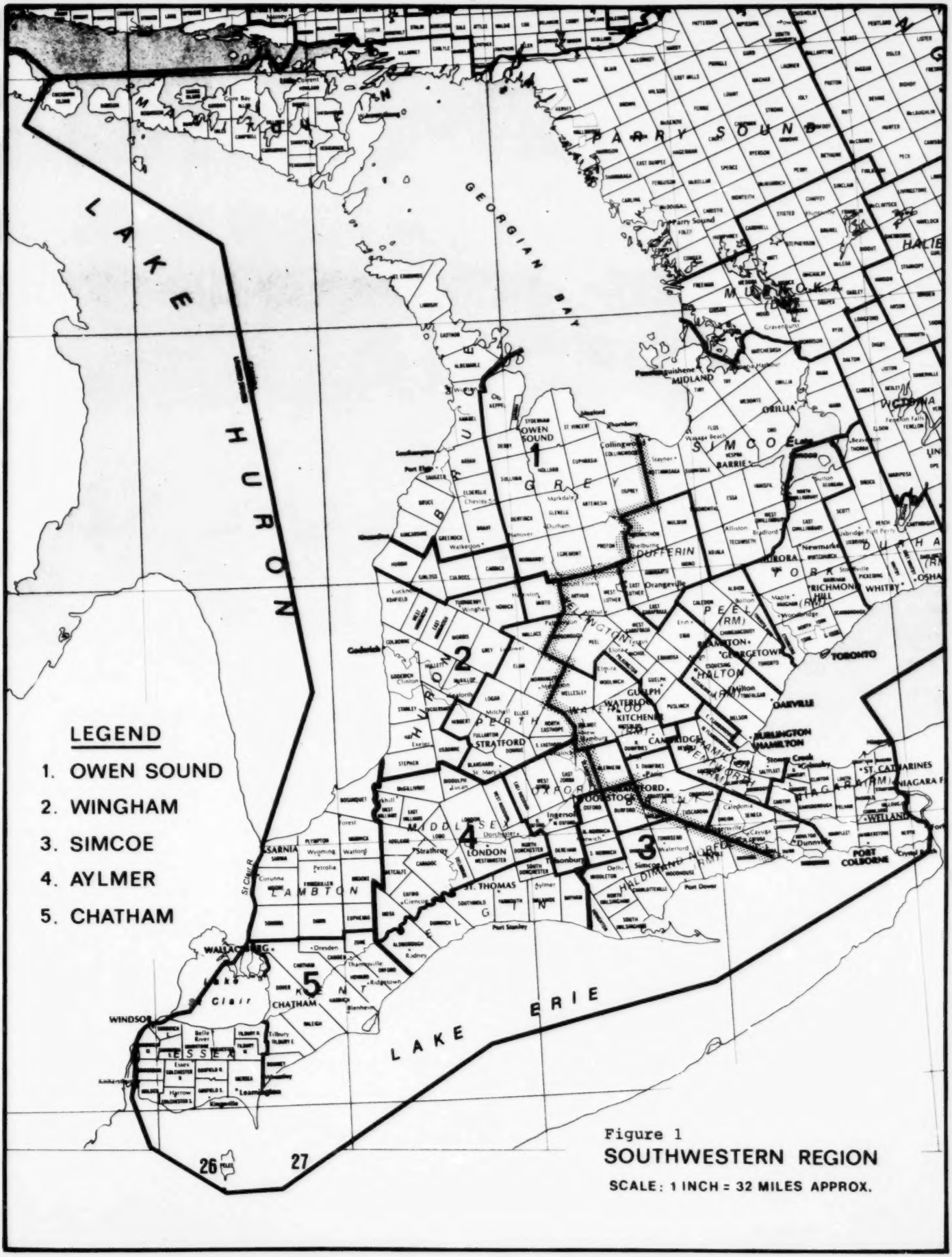
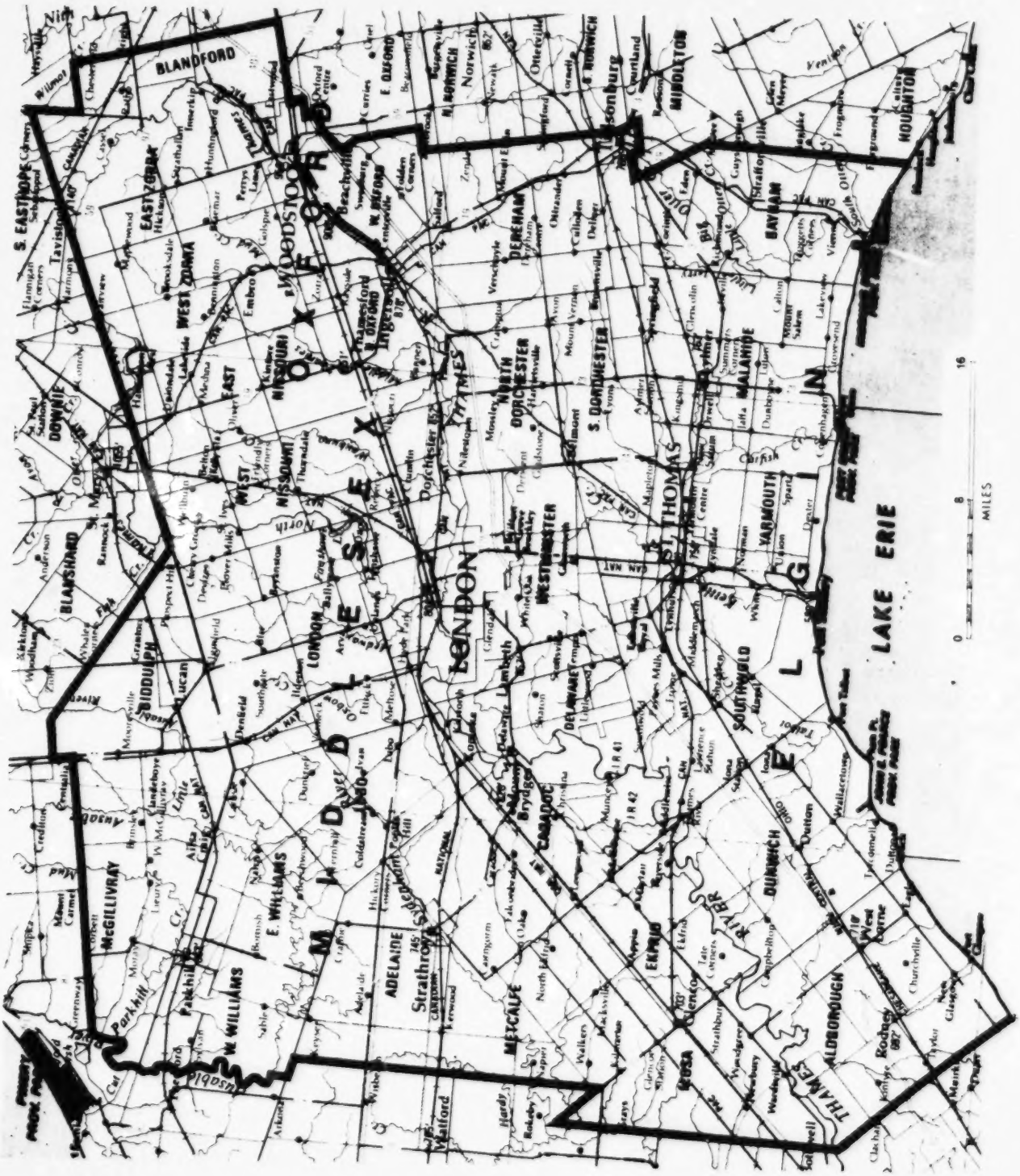


Figure 1
SOUTHWESTERN REGION
SCALE: 1 INCH = 32 MILES APPROX.

Ministry of Natural Resources
Ontario

Figure 2
AYLMER
ADMINISTRATIVE DISTRICT
SOUTHWESTERN REGION



The District has a total land and water area of approximately 940,000 ha (2,322,791 acres). The water area alone is approximately 270,100 ha (667,432 acres). The largest water body in the District is Lake Erie. The District is responsible for 266,600 ha (658,783 acres) of the lake and this represents 99% of the total District water area (Figure 3 - see back report cover pocket). Inland waters represent 1% or 3,500 ha (8,649 acres) of the District's surface water area. Sixteen major river systems drain the District's land base and contain all its lakes, rivers and streams. The inland water surface area is made up of 1925 ha (55%) of warmwater reservoirs, 1,018 ha (29%) of warmwater streams and 556 ha (16%) of coldwater streams (Figure 4 - see back report cover pocket).

District fish populations are generally productive, self-perpetuating and comprised of an assortment of fish species. Three factors combine to produce these conditions. Firstly, good quality, well buffered, hard water flows from the imperfectly to well drained clay and sandy soils characteristic of the area. This aquatic environment is conducive to healthy fish populations. Secondly, three Great Lake watersheds (Huron, St. Clair and Erie) provide a diversity of fish species for inland watercourses. Finally, the District's location in southern Ontario, surrounded by the Great Lakes, affords a moderated climate and an extended growing season relative to other areas of the province.

2.2 POTENTIAL YIELD AND CURRENT YIELD

Potential yield is a theoretical calculation of the amount of fish flesh that could be removed from the water on a sustained basis. This calculation is a management tool and is compared to current yield to determine whether a system is under- or over-harvested. Current yield is the estimated potential yield at the present time under existing conditions. Current yield should not exceed potential yield if a fishery is to be managed on a sustained basis through time.

A comparison of current and potential yields show that overall District fisheries are producing near their potential (Table 1). Current yield for inland waters, however, is estimated to be 33,900 kg or only 51% of a potential yield of 66,600 kg. Reasons for this include:

- theoretical reservoir potential yields were based on mean water levels that support peak biological production. Current yield reflects lower fish production because of reservoir management practices such as periodic maintenance draw-downs which may reduce water volume by as much as 100%. These practices act to diminish a reservoir's ability to produce fish.

- reservoir/lake and stream potential yields were based on ideal environmental conditions. Current yield estimates, however, reflect present conditions which have negative impacts on fish production (due

TABLE 1: CURRENT YIELD AND POTENTIAL YIELD, AYLMER DISTRICT (in thousands of kilograms per year).

	CURRENT YIELD		POTENTIAL YIELD	
INLAND WATERS	33.9		66.6	
Sport Fish:		27.9		55.6
reservoirs & lakes		16.0		32.7
streams:		11.9		22.9
warmwater		10.5		19.5
coldwater		1.4		3.4
Bait Fish:		6.0		11.0
LAKE ERIE	1227.0		1227.0	
Sport Fish		126.3		126.3
Commercial Fish		1139.7		1139.7
Bait Fish		11.0		11.0
DISTRICT TOTAL	1310.9		1342.6	
Sport Fish		154.2		181.9
Commercial Fish		1139.7		1139.7
Bait Fish		17.0		22.0

See GLOSSARY for terms used in this table.

to habitat degradation, for example).

The potential yield of commercial fish species is based on the best available information provided by the Lake Erie Fisheries Station who utilize the most up to date modelling techniques to assess trend through time data.

2.3 CURRENT USE AND PROJECTED USE OF THE RESOURCE

Current and projected resource uses are estimates of how much fish is currently being used and how much is expected to be used by different user groups in the future. The methodology used to derive these estimates is unique for each user group as outlined in the Background Information document.

The purpose in deriving these estimates is to allow fisheries managers to assess actual fish yields to determine if the supply of fish is adequate to meet present and future demands.

One of the purposes of this Plan is to prescribe the course of action necessary to satisfy projected use in the District (Table 2).

Sport fish species associated with the inland waters of Aylmer District include large- and smallmouth bass, panfish (eg. rock bass, sunfish, and crappie), northern pike, walleye (yellow pickerel), yellow perch, trout (rainbow, brown and brook) and chinook salmon. Lake Erie sport fish include yellow perch, walleye, white bass and rainbow smelt. The 1980 Provincial Angler Survey indicated that 99% of sport fishermen in the District were residents of Ontario. It follows, therefore, that the vast majority of new sport fishing opportunities will be used by Ontario anglers.

District sport fisheries historically provided approximately 50,000 angler days per year. User surveys for 1985 showed an increase to 100,000 angler days. This discrepancy may have been due to an actual increase in use or to survey design refinements. A conservative estimate of current use based on the latter figures is 87,000 angler days per annum. Projected use by the year 2000 will be 100,000 angler days based primarily on an estimated 15% increase in the human population, as well as an increased availability of fish stocks.

Records for District commercial fisheries indicate an estimated annual harvest of yellow perch, rainbow smelt, white bass, walleye and other species (see Appendix 1) totalling 1,170,000 kg. MNR initiated the modernization of the commercial fishing industry in 1984 with a quota management process that restored stability to the industry and provided a mechanism to take advantage of prolific fish stocks without jeopardizing the well-being of other stocks. Licences now prescribe harvest quotas for each fish species. Licensed quotas are based on theoretical potential yield estimates and consider ongoing fish population modelling exercises. Annual adjustments are made to optimize harvest, to ensure healthy fish stocks and to maintain a practicable industry.

TABLE 2: CURRENT AND PROJECTED RESOURCE USE, AYLMER DISTRICT.

	CURRENT USE	PROJECTED USE
SPORT FISH	30,000 kg 87,000 angler days[1]	61,000 kg 100,000 angler days
COMMERCIAL FISH	1,543,600 kg	3,128,000 kg[2]
BAIT FISH	5,500 kg 45,735 dozen	3,400 kg 28,000 dozen

NOTES :

1. An 'angler day' represents the amount of fishing effort expended on a fishing occasion. It is normally set equal to four hours for planning purposes.

2. The projected use of commercial fish was set at the 1985 quota allocation level for Aylmer District waters.

The District issued 32 commercial fishing licences in 1985 - thirty licences authorized harvest of fish by gill and trawl nets, and 2 licences authorized harvest of fish by hooks. The 1985 allocation for yellow perch, smelt, white bass and walleye was increased to 3,128,000 kg to reflect increased natural production. Notwithstanding this however, the reported harvest for these species in 1985 was only 1,543,600 kg. The projected use of commercial fish equals the 1985 quota and presumes efficient use of assigned quotas will occur on a sustained basis.

In 1985 sixty-four bait fish licences were issued: 42 licences authorized harvesting by nets and 22 licences were for dealers and preservers. District bait fish harvest figures indicate an average harvest of 20,000 dozen per annum. The 1985 harvest of 45,735 dozen was considered to be a short term peak and was comprised of 45,590 dozen from inland waters and 145 dozen from Lake Erie. The harvest consisted of shiners (61%), suckers (28%), chub (11%) and other species (1%). A more conservative projected yield is 28,000 dozen in the year 2000. The harvest of bait fish has been restrained in twenty streams through licensing to protect resident brook trout populations.

Non-consumptive use of fish in the District includes fish viewing, live release of sport fish, educational use and research on live fish. It is expected that non-consumptive use will increase with increased fish habitat rehabilitation, user access development and human population growth because of the greater likelihood of people seeing more fish.

2.4 OTHER RESOURCE MANAGEMENT PROGRAMS

Other resource management programs were considered during the preparation of this Plan because of their potential to affect fish and fisheries.

There are at least 1,000 dams situated on District watercourses. The main purposes of these dams are: flood control, water flow augmentation and agricultural irrigation. Dams affect fish communities by restricting movements of fish, by confining various fish populations to different portions of a stream and by impairing water quality for downstream biota in particular. These problems usually stem from the creation of reservoirs or changes in stream hydrology. Water impounded by reservoirs tends to be warmer, more turbid and not as well oxygenated as stream water. Downstream discharges tend to have negative effects, therefore, on stream organisms including fish and aquatic invertebrates. The District liaises with various land use managers and planners to ensure that conflicts do not arise from the multiple uses of water.

Maintenance of environmentally sensitive areas which may provide important spawning and nursery habitats as well as feeding areas for local fishes are important to the District's fisheries program. By 1986 the District had evaluated 125 wetland complexes and had identified 34 Areas of Natural and Scientific Interest (ANSI) or Carolinian Canada Sites

(CCS). High quality wetland areas are associated with seven District trout watercourses: Bradley, Caddy, Dorchester Swamp, Five Points, Foldens and Komoka creeks; and Lake Whittaker. These must be protected to conserve the coldwater fish communities inhabiting these areas. Eight ANSI's and five CCS's adjoin the Big Otter, Catfish, Kettle and Talbot creeks, as well as the Thames and Ausable rivers.

Fish are valuable indicators of the health of ecosystems in which they thrive due to their dependence on adequate quantities of high quality water. Water quality is largely determined by land use practices, so fisheries management activities must be integrated with other resource use programs such as forestry and agriculture. Other wildlife species also depend on fish and fish habitat. For example, 80% of a bald eagle's diet is fish, and 'clean' fish will play a major role in rehabilitation programs for this endangered species. Many other water birds and fur-bearers also eat fish.

2.5 PROBLEMS AND ISSUES

Many water uses may affect fisheries resources causing interrelated problems and reduced fish production.

Problems and issues are outlined below. Strategies and tactics presented later in the Plan (Section 3.0) will address these and will show how fisheries objectives and targets can be met.

(1) Degraded Habitats

Fish habitat degradation and loss can occur for a number of reasons. Examples include:

- stream course alteration for urban and rural development and agricultural drainage

- shoreline development which removes or covers fish habitat such as marshy areas and wetlands along lake shores or stream banks

- harbour development and dredging that removes shoals along Lake Erie's shorelines

- instream or by-pass ponds and cattle watering areas which impede or contaminate naturally flowing water

All these activities have in some way degraded the environmental quality of every watercourse in the district. The resultant loss of fish habitat has changed or reduced fish species production from these waters as well. Seventy-five streams have been degraded to such an extent that they no longer produce desired sport fish.

Public consultation identified a high level of concern about degraded fish habitats.

(2) Inadequate Knowledge About the Resource

Fisheries managers are often hampered by inadequate knowledge about fish production in bodies of water and yields of fish being harvested, the expectations of resource users, and long term species interactions.

One hundred and forty-two watercourses lack the aquatic habitat inventory survey information needed to map

critical fish habitats such as spawning grounds, nursery areas and adult refuges. Some of these watercourses include: Big Otter, Catfish, Kettle, Silver, South, Otter, McKay, East, and Talbot creeks; Lake Erie Tributary 2; and the Ausable, Sydenham and Thames rivers. Better information and ongoing data collection are required for sound fisheries management to continue.

The public is moderately concerned about this problem.

(3) Limited Access to Sport Fishing Opportunities

Angling opportunities and consumptive use of fisheries resources are reduced wherever access to water is made difficult by terrain, fluctuating water levels and private land ownership. This issue pertains primarily to Lake Erie and inland rivers such as the Thames where a shortage of launching facilities and docks restrains sport fishing activity.

The public considers physical access to fisheries with a moderate to high level of concern.

(4) Underutilized Species and Habitat

There are a number of fish species, including carp, sucker, catfish and freshwater drum, that are considered undesirable by anglers and when caught are not utilized for food. They are generally discarded and not thought of as having contributed to angling quality. Prolific or abundant species must be kept in check by regular harvesting to ensure species communities stay in balance. Selective over-harvesting of only preferred game fish species can cause their demise as competitor species or even prolific prey species take over to fill the void left in the fish community structure.

Six streams are not being fully utilized for fish production because of dams that restrict upstream migration of desired fish species to more productive habitat. These include the upstream sections of: the North and Middle Thames rivers, and the south branch of the Thames River between London and Woodstock for walleye migration; and the Big Otter Creek for rainbow trout migrations.

The public perceives underutilization of fishing opportunities and fish habitats with a high level of concern.

(5) User Group Competition

Conflicts among sport, commercial food and commercial bait fishermen arise from historical use of fisheries resources, from the expectations of the different user groups and from periodic competition for the same fish species in a given body of water. This issue hinders cooperative management of the resource and is perhaps more perceived than factual. MNR is committed to a fair and equitable allocation of fisheries resources amongst user groups.

The public considers this problem with moderate concern.

(6) Competition for the Water Resource

An issue is the use of natural

waters for purposes other than for production of fish. Competing urban and rural water uses are exemplified by damming of district watercourses for: flood control and water retention, low water flow augmentation for effluent dilution from sewage treatment plants or lagoons, and water storage in agricultural areas for irrigation and cattle watering.

The public perceives uses of natural waters which restrain or are incompatible with fish production with a high degree of concern.

(7) Illegal Harvest (Poaching)

Illegal harvests generally focus on spawning periods when fish - especially walleye, rainbow trout and smallmouth bass - are vulnerable to excessive exploitation. Left uncontrolled these can result in the loss of brood stock and a long term reduction in fish production. Taking more than the legal limit of sport fish and non-compliance with commercial fish quotas can deplete fish stocks. Enforcement activities seek to minimize illegal harvests especially during the spring and fall.

The public is highly concerned about this problem.

(8) Lack of Public Awareness

Fisheries managers feel the public appreciate neither the complexities of fisheries management nor how it relates to wise land use management practices. This has led to a lack of recognition of fisheries concerns in land use planning processes and a misunderstanding amongst land use planners and managers of the importance of diverse fisheries resources which are able to satisfy the demands of many different user groups. There is a need for the public and specific users of fisheries resources to adopt a stewardship ethic towards fish and fish habitats. Fisheries are a renewable common property resource which cannot sustain unlimited use. They must be managed within the framework of healthy ecosystems of which watercourses and fish are only constituent parts.

The public has a high level of concern about the lack of public awareness of the measures needed to conserve fisheries resources.

(9) Presence of Migratory Species from Outside the District

Migrations of spawning fish into District streams provide many sport fishing opportunities. For example, walleye from Lakes Huron, St. Clair and Erie spawn in the Thames River. Aylmer District helps ensure these fish reproduce successfully by maintaining a fishing sanctuary downstream of Middlemiss bridge. Before and after spawning, however, adult fish live in waters managed within the jurisdictions of other agencies. The management techniques used by these agencies can influence the number of spawners available each year and, therefore, the number of sport fishing occasions in the Aylmer District. For example, the District has benefitted from salmon stocking programs on the Great Lakes as these fish are beginning to provide numerous fall sport fishing opportunities.

The public has a low level of concern about interagency management of common fish stocks.

(10) Wholesomeness of Fish

Are fish caught by anglers in the District fit for human consumption? According to the joint MNR-MOE publication: 'Guide to Eating Ontario Sport Fish 1988', fish may generally be consumed if harvested from District waters. Anglers are cautioned, however, against eating large walleye from the Thames River and large Lake Erie white bass, channel catfish and freshwater drum. Consumption of these fish should be done in accordance with the guidelines.

The public is highly concerned about safe consumption of sport fish.

(11) Loss of Fish Species, Fish Stocks and Fishing Opportunities

Angler demand for certain species such as brook trout and rainbow smelt exceeds resource supply in the District because of inadequate habitat production capabilities, poor access to these fisheries resources, and, in the case of smelt, changes in the Lake Erie fish community. Fishing opportunities for brook trout and rainbow smelt have been lost.

Invasions of new, or exotic, fish species can disrupt the structure of a fish community. This can result in displacement of native species or loss of fish stocks.

Six provincially rare or endangered fish species are found in the District: central stoneroller, silver shiner, brindled madtom, silver chub, spotted sucker and river redhorse. These species are vulnerable to extirpation if their remaining habitats are destroyed or altered.

The blue pickerel was a desired food and recreational fish species which became extinct during the 1950's. In Lake Erie this resulted in the loss of commercial and sport fishing opportunities; the loss of a top predator from the deeper colder waters of the lake; and the loss of this species' unique genetic material.

The public has a high level of concern about the loss of fish species, fish stocks and fishing opportunities.

3.0 MANAGEMENT DIRECTION

3.1 GENERAL FISHERIES MANAGEMENT OBJECTIVES

The goal of the Ministry of Natural Resources is to provide opportunities for outdoor recreation and resource development for the continuous social and economic benefit of the people of Ontario and to administer, protect and conserve public lands and waters.

The objectives of fisheries management in southern Ontario are to provide opportunities for sport fishing and to realize economic benefits from commercial and bait fisheries for the people of Ontario while maintaining healthy fish communities.

3.2 FISHERIES MANAGEMENT OBJECTIVES, TARGETS, STRATEGIES and TACTICS

This document outlines a number of specific objectives and targets that were developed for local sport, commercial food and commercial bait fisheries, as well as for rare or endangered fish species. These focus on protecting local fish communities in order to supply required resource use opportunities.

Fisheries targets originally presented in the DLUG were fine tuned during the DFMP planning process. Target testing exercises led to the revised targets contained in this Plan that more accurately portray achievable levels of fisheries production and use. Long term management strategies and tactics were then formulated. These outline how the specific fisheries objectives and targets are to be achieved by the year 2000.

The strategies and tactics listed in this section represent all the activities that are felt to be appropriate for the District. While it will not be possible, nor intended, that these be implemented all at once, they relate methods the District could use to achieve its objectives.

Fisheries management in Aylmer District will be described for three different categories of bodies of water: Lake Erie; inland streams; and inland reservoirs, lakes, and privately owned ponds.

3.2.1 SPORT FISHERIES MANAGEMENT OBJECTIVE

To meet the projected demand within the limits of a wisely managed and rehabilitated resource.

SPORT FISH TARGETS

To provide 100,000 angler days of sport fishing opportunities and a harvest of 61,000 kg (134,500 pounds) of sport fish annually by the year 2000.

DISCUSSION

Originally, the DLUG targets indicated the District would provide 75,300 sport fishing opportunities and the production of 46,000 (101,400 pounds) of sport fish annually by the year 2000.

During the District's fisheries planning process, however, the DLUG target was re-evaluated. It was determined that 100,000 sport fishing opportunities and associated harvest of 61,000 kg better reflected projected use of the resource in the year 2000. This maintains the District's quality standard target for sport fishing opportunities (0.61 kg of sport fish per fishing occasion) and means that sport fishing is not expected to deteriorate in the District for the duration of this plan.

Achievement of this target will require increased access to sport fish populations, increased yields from under-harvested waters, and management information about: underutilized habitats, fish species ecology, and use of private fishing preserves. Sport fish targets will be met using warmwater and coldwater species from Lake Erie and inland streams; and using warmwater species from inland reservoirs, lakes and privately owned ponds.

Lake Erie waters comprise

approximately 99% of the District's total water surface area. They currently produce 82% (126,300 kg/yr) of the District's total sport fish current yield (Table 1). Lake Erie could fulfil 69% of the District's total sport fish potential yield (Table 1). The most sought after sport fish species in the lake are yellow perch, walleye, white bass, rainbow trout, salmon and rainbow smelt.

The sport fishing demand for smelt focuses on Port Glasgow, Port Stanley, Port Bruce and Port Burwell, and exceeds supply. Smelt are less available because of many factors including: over-harvesting prior to 1984, reproductive failures, increased predation by an expanding walleye population, and off shore spawning in areas not accessible to people using dip nets.

Inland waters currently produce 18% (27,900 kg/yr) of the District's total sport fish but could fulfil 31% (55,600 kg/yr) of the District's total sport fish potential yield (Table 1). Reservoirs and lakes could provide 59%, warmwater streams 35%, and coldwater streams 6% of inland water potential sport fish yield.

Reservoir sport fisheries utilize the yellow perch, northern pike, smallmouth and largemouth bass, panfish and catfish populations found primarily in conservation area reservoirs such as: Fanshawe Lake, Gordon Pittock Reservoir and Wildwood Lake (Upper Thames River Conservation Authority); Springwater Pond (Catfish Creek Conservation Authority); and Lake Whittaker (Kettle Creek Conservation Authority). Largemouth bass and panfish are the more commonly angled species from privately owned ponds. Warmwater systems provide the largest potential yield from inland streams. Notable inland stream fisheries concentrate on: the spring walleye spawning run in the Thames River to the City of London; the spring northern pike and yellow perch spawning runs in the Thames River to the City of Woodstock; smallmouth and largemouth bass throughout the Thames River; and the trout and salmon runs in Big Otter, South Otter, Silver and Catfish creeks. It is suspected that these fisheries could sustain more intense angling than they presently do.

The demand for coldwater species from inland streams exceeds supply.

Introduced species such as rainbow trout, brown trout and pacific salmon exhibit limited distribution across the District because of less than optimal habitats. Current yields of brown and brook trout, in particular, are restrained by degraded stream habitat.

Private sector fish hatcheries and fishing preserves provide additional sources of fish production, employment and sport fishing opportunities. It is anticipated that these operations will continue to satisfy their clients' demands.

Conflicts between resource users might arise as sport fisheries expand.

STRATEGIES

(SF-1) To protect fish habitat in

waters already supporting resident sport fish populations:

The following tactics address: degraded habitat, competition for the water resource, wholesomeness of fish, and loss of fish and fishing opportunities.

- enforce legislation pertaining to fish habitat protection consistent with a 'net gain' of fish habitat philosophy
- liaise with municipalities and other government agencies to ensure that sensitive coldwater streams receive recognition during the plan input and review stages for work in or near natural waters including impoundments, drains and wetlands
- cooperate with other agencies such as the Ministry of the Environment (MOE) to collect and report information on fish kills and contaminant spills
- inform and educate the public about the impacts of various land use practices on the aquatic environment by issuing news releases and/or information pamphlets
- maintain existing stream canopies, wetlands and coldwater sources such as aquifers and springs in headwater areas by controlling tree cutting in these areas
- identify sensitive areas through stream habitat inventory and assessment surveys to update plan input and review data bases
- encourage landowners and their agents to mitigate water quality degradation by their activities in or near sensitive streams through improved land use practice

(SF-2) To maintain and increase existing sport fish occasions:

The following tactics address: loss of fish and fishing opportunities, inadequate knowledge about the resource, competition for the water resource, competition between user groups, degraded habitat, and presence of migratory species.

- enforce fishing regulations to prevent the excessive harvesting of local fish populations
- prevent the introduction or spread of disease into new waters by stocking, or allowing to be stocked, only fish which are disease free according to provincial standards and guidelines
- establish no fishing sanctuaries and closed seasons to protect vulnerable fish populations during spawning and nursery periods
- attempt to redirect fishing effort to waters identified by angler surveys as underutilized both to mitigate concentration of fishing pressure and to reduce local depletion of fish stocks by improving access and through communications efforts
- assist the Canada Department of Fisheries and Oceans in sea lamprey control by recording lamprey spawning activity and parasitism information from sport fish harvests
- request lamprey barriers in future fishways to prohibit access to spawning grounds
- rehabilitate existing fish habitat by applying the best available science and technology, such as creation of artificial spawning beds
- encourage the removal of in-stream barriers such as dams and discourage construction of

new barriers which limit the movement of fish by enforcing the Lakes and Rivers Improvement Act where appropriate
- prohibit bait fish harvesting from selected streams to prevent incidental catches of salmonids
- install fishways where appropriate to increase access to suitable upstream habitat

(SF-3) To implement a comprehensive fisheries assessment program to monitor sport fish populations and habitat conditions:

The following tactics address: degraded habitat, wholesomeness of fish, inadequate knowledge about the resource, and presence of migratory species.

- conduct Aquatic Habitat Inventory Surveys on streams requiring original surveys
- assess fish habitat and monitor water quality on selected streams to update baseline information
- cooperate with other agencies such as MOE to collect samples for the sport fish contaminant monitoring program
- conduct tagging studies on selected migratory fish species to assess fish movements and habitat utilization
- encourage sportsmens' clubs and other interested groups to monitor fish habitat conditions in District watercourses, particularly water temperature
- conduct creel surveys to assess and evaluate survival and harvest of fish stocked in the District
- develop an indexed fish sampling program to monitor the status of local fish populations by electrofishing and netting
- encourage the Lake Erie Fisheries Assessment Unit to conduct surveys, fish sampling and habitat inventories and assessments under the direction of the Lake Erie Management Committee

(SF-4) To monitor exploitation rates of various sport fish species:

The following tactics address inadequate knowledge about resource use.

- conduct creel surveys to estimate current use of sport fisheries
- encourage Conservation Authorities to conduct standardized creel surveys on reservoirs within their jurisdiction
- encourage local sportsmen to maintain angler diaries to evaluate specific use of particular sport fisheries
- encourage local fishing derby organizers to collect and record specific derby harvest and fishing pressure information
- encourage Lake Erie charter boat operators to cooperate with the Lake Erie Fisheries Station by maintaining daily logs of sport fish catches and fishing pressure
- encourage CFIP proponents to investigate angling pressure and exploitation rates on watercourses they are interested in rehabilitating

(SF-5) To rehabilitate degraded sport fish habitat:

The following tactics address degraded habitat.

- continue projects to rehabilitate degraded sport fish habitat in lakes and streams
- encourage CFIP activities to improve degraded coldwater habitat
- develop, in cooperation with local municipalities, Conservation Authorities and other interest groups, long term reforestation plans along denuded stream corridors to provide canopies that will mitigate solar warming of coldwater streams
- conduct workshops to advise and encourage lead agencies such as the Conservation Authorities and the Ontario Ministry of Agriculture and Food (OMAF) to promote erosion control and drain restoration
- continue ongoing extension activities, including landowner contact, to inform the public about harmful developments in or near watercourses

(SF-6) To increase sport fish opportunities by redirecting effort to underutilized sport fish species:

The following tactics address loss of fish and underutilized species.

- inform and educate the public about sport fishing opportunities for underutilized fish species such as suckers and catfish by issuing news releases and information pamphlets
- support the efforts of individuals and organizations to develop recipe books for fish species which are not currently retained by anglers
- promote the harvest of underutilized or overabundant fish species by legal sport fishing means other than angling such as netting, spearing and archery

(SF-7) To increase angling opportunities by creating artificial sport fisheries in selected waters on an interim basis to satisfy local demand or to divert pressure from natural sport fish populations:

The following tactics address loss of fish and fishing opportunities.

- conduct workshops, in cooperation with OMAF, to encourage entrepreneurs to manage fishing preserves and fish production to satisfy the demand for artificial fisheries
- encourage the Ontario Trout Farmers' Association to promote the establishment of fishing areas by their members and to inform the public about private hatcheries and fishing preserves by issuing news releases and information pamphlets
- purchase disease free rainbow trout from the private sector to plant in public waters for 'put-and-take' type fishing

(SF-8) To supplement, increase and diversify natural sport fishing opportunities with fish plantings according to provincial standards and guidelines:

The following tactics address loss of fish and fishing opportunities.

- approve Community Fisheries Involvement Program (CFIP) upwelling incubation boxes, for salmonid production, and fish transfer projects, primarily for bass and crappie

- transplant adult fish to selected waters primarily to establish self-sustaining *populations of walleye or bass*

(SF-9) To encourage public participation in local sport fisheries management:

The following tactics address lack of public awareness.

- encourage public involvement in large scale fisheries restoration projects, such as the London Urban Fisheries Program, to develop partnerships with specific user groups interested in sharing stewardship of local fisheries resources
- promote participation in CFIP amongst local sportsmens' clubs and other conservation oriented groups
- conduct workshops to publicly review completed fisheries projects

(SF-10) To inform non-consumptive users of existing fish viewing opportunities:

The following tactics address lack of public awareness.

- prepare and distribute information pamphlets or news releases about seasonal opportunities to view fish, during spawning migrations for example
- make provisions for fish viewing when designing fishways

(SF-11) To increase public sport fishing access to Lake Erie and inland waters:

The following tactics address: limited access, loss of fishing opportunities, lack of public awareness, and competition between user groups.

- encourage landowners to provide public fishing access
- encourage entrepreneurs and other agencies, eg. municipalities, to develop revenue generating access points, eg. boat launches
- advise the Ministry of Government Services (MGS) of opportunities to buy land on a 'willing seller' basis, and if successful, develop access to satisfy local demand where: fish populations can withstand increased pressure, existing access is limited and other alternatives to establish public fishing access are not practicable
- inform and educate the public about available access points by issuing news releases or information pamphlets
- on an experimental basis, try restraining commercial fishing activity in designated nearshore areas of Lake Erie for the exclusive use of sport fishing vessels
- encourage sportsmens' clubs to initiate landowner negotiations for permitted access over private lands to satisfy localized sport fishing requirements

(SF-12) To mitigate the loss of sport fish habitat because of water level fluctuations in reservoirs:

The following tactics address: competition for the water resource, degraded habitat, and lack of public awareness.

- advise agencies, such as the City of London, that regulate the timing of low water flow

augmentation for sewage dilution not to interrupt critical fish spawning and hatching periods
- contour floodplains and reservoir shorelines to provide experimental spawning and nursery habitats for selected fish species by creating subimpoundments for controlled water retention during draw downs
- supply operating agencies, such as Conservation Authorities, with information to prevent scheduled water related maintenance and development from impacting on spawning and hatching periods for selected fish species

3.2.2 COMMERCIAL FISHERIES MANAGEMENT OBJECTIVE

To maintain practicable commercial fisheries under the quota management system.

COMMERCIAL FISH TARGET

To achieve a sustainable harvest of 1,139,660 kg of fish per annum by the year 2000.

DISCUSSION

The DLUG target identified the need for 1,109,000 kg of commercial fish per annum by the year 2000. This target was further revised to 1,139,660 kg of fish per annum by the year 2000 during the District's fisheries planning process.

The revised target of 1,139,660 kg represents a decrease from current use of 1,543,600 kg of fish and from projected use of 3,128,000 kg of fish per annum (Table 2). However, the revised target better reflects resource productivity and improving environmental conditions which should increase the abundance of desired predatory fish, such as walleye, while decreasing presently over-abundant species such as white perch. Thus, the revised target reflects a higher quality harvest. A decrease in total commercial harvest from current use to the target is feasible since proportionally more marketable and higher value species such as yellow perch and walleye will be harvested. Yellow perch, rainbow smelt, walleye and white bass are the major species sought.

MNR management of Lake Erie's commercial fisheries includes cooperative management with American jurisdictions to ensure that balanced harvests of fish stocks occur and that management strategies are compatible and complementary.

STRATEGIES

(CF-1)To maintain commercial fishing on Lake Erie to harvest prescribed annual allowable yields of fish:

The following tactics address: loss of fish and fishing opportunities, competition between users, underutilized species, and lack of public awareness.

- regulate the harvest by assigning yearly quotas
- promote utilization of all species harvested by encouraging innovative marketing techniques for underutilized species such as carp, catfish, freshwater drum and sucker, and by assisting in the development of markets for these fish

- continue to limit further entry into the fishery to ensure the continued viability of businesses and to prevent over-exploitation of local fish stocks
- liaise with user groups to facilitate dialogue about commercial fishing industry concerns
- inform and educate the public about the commercial fishing industry's role as a valid user of the fish resource through communication activities
- encourage commercial fishermen to continue to work with MNR and special interest groups to resolve resource allocation conflicts by facilitating meetings between all concerned

(CF-2) To conserve and protect Lake Erie commercial fish communities:

The following tactics address: illegal harvest, loss of fish and fishing opportunities, and degraded habitat.

- enforce fisheries regulations to ensure compliance with quotas and accurate reporting of catches
- assist the Federal Department of Fisheries and Oceans in sea lamprey control by sampling commercial catches and recording wounding rates
- cooperate with MOE by collecting and reporting information on fish kills and contaminant spills in Lake Erie tributaries
- maintain fish habitat by discouraging Lake Erie shoreline development projects which lead to loss of fish habitat and by promoting fish habitat rehabilitation and enhancement during plan review exercises

(CF-3) To develop fisheries assessment programs to monitor commercial fish populations:

The following tactics address: degraded habitat, inadequate knowledge about the resource, competition between user groups, and loss of fish and fishing opportunities.

- encourage the Lake Erie Fisheries Assessment Unit to quantify commercial exploitation rates and to sample fish to monitor biological indicators such as growth, fecundity and onset of maturity
- encourage LEFAU to investigate the factors that limit recruitment of yellow perch

(CF-4) To promote CFIP to the commercial fish industry:

The following tactics address: loss of fishing opportunities, degraded habitat, lack of public awareness, and competition between user groups.

- encourage the commercial fish industry to support and become involved in CFIP activities as these benefit common property fish stocks by distributing CFIP information pamphlets to commercial fishermen and fish producers

3.2.3 BAIT FISH MANAGEMENT OBJECTIVE

To manage local bait fish populations to maintain commercially viable industries.

BAIT FISH TARGET

To provide 28,000 dozen bait fish

per annum by the year 2000.

DISCUSSION

The DLUG target of 20,000 dozen bait fish per annum has been revised to 28,000 dozen per annum by the year 2000 to better reflect harvest trends and the expansion of this fishery into Lake Erie. The revised target replaces the DLUG target and will be met using bait fish from both Lake Erie and inland waters.

It is anticipated that the demand for bait fish will increase as the local sport fishery expands. More conflicts between bait fishers and landowners are expected to occur as the demand for bait fish increases.

STRATEGIES

(BF-1) To protect existing bait fish populations:

The following tactics address: loss of fish and fishing opportunities, illegal harvest, and lack of public awareness.

- enforce regulations for reporting harvests and sales of bait fish
- conduct workshops to inform commercial bait fish harvesters and dealers of the legislation pertaining to the bait fish industry
- limit entry to this fishery where necessary to prevent legal over-harvesting
- issue information pamphlets to inform the public of the legislation related to the harvest and use (personal or commercial) of bait fish and to solicit help in reporting violations

(BF-2) To develop bait fish assessment programs to monitor bait fish populations:

The following tactics address: inadequate knowledge about the resource, and underutilized species.

- determine current production of bait fish by conducting population studies and indexed sampling
- ensure accurate reporting occurs and that populations in heavily utilized areas are not being depleted by closely monitoring annual bait fish harvest returns
- identify bait fish habitats by conducting Aquatic Habitat Inventory and Stream Habitat Assessment surveys

(BF-3) To optimize the current harvesting of bait fish from inland waters:

The following tactics address: competition between user groups, loss of fish, and inadequate knowledge about the resource.

- redistribute and diversify fishing pressure by issuing bait fish harvesting licences which provide for exclusive harvesting on the basis of area or season
- resolve harvesting issues such as access and species utilization by encouraging bait fishers to work cooperatively with MNR, special interest groups and landowners
- encourage bait fishers to assist MNR in managing local bait fish populations by collecting fish samples and by conducting habitat surveys

(BF-4) To increase the availability of bait fish for sale to anglers:

The following tactic addresses: competition between user groups and loss of fish and fishing opportunities.

- reduce pressure on native populations and supplement current natural production by encouraging private sector aquaculture to rear bait fish

3.2.4 PROVINCIALLY RARE OR ENDANGERED FISH SPECIES MANAGEMENT OBJECTIVE

To prevent the extirpation of any native fish species and to promote the natural expansion of the current distribution of rare, threatened, or endangered species in the District.

RARE OR ENDANGERED SPECIES TARGET

To preserve the current distribution of rare or endangered fish species in the District.

DISCUSSION

The DLUG target was to ensure that no native fish species became extinct. The revised target, stated above, better reflects the need to protect declining or remnant fish populations and their habitat in the District.

Rare or endangered fish species include those which have been identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and those afforded status under the Endangered Species Act. Six rare fish species are found in the District: central stoneroller, silver shiner, bridled madtom, silver chub, spotted sucker and river redhorse. One species - the blue pickerel - has been designated as extinct and had inhabited Lake Erie waters.

STRATEGIES

(R/E-1) To protect the habitat of rare or endangered fish species:

The following tactics address: inadequate knowledge about the resource, and degraded habitat.

- enforce legislation pertaining to fish habitat protection such as the Fisheries Act and the Endangered Species Act
- support scientific research into habitat requirements for life stages of rare or endangered fish species by authorizing field work and data collection as appropriate

(R/E-2) To preserve existing populations of rare or endangered fish species:

The following tactics address: illegal harvest, loss of fish, and inadequate knowledge about the resource.

- prevent the harvest of rare or endangered fish species by enforcing legislation such as the Endangered Species Act and by not permitting bait fish harvesting from waters containing rare or endangered fish species
- support scientific research into fish species distribution by authorizing specimen collection as appropriate

(R/E-3) To inform and educate the public about the status of rare or endangered fish species

The following tactics address:

loss of fish, and lack of public awareness.

- issue news releases and disseminate information on the status of rare or endangered fish species in District waters to land use planners and managers to ensure these fish receive special recognition in plan review exercises
- heighten public awareness about rare or endangered fish species by distributing pamphlets and posters describing these species

4.0 IMPLEMENTATION

4.1 GENERAL BACKGROUND

This District Fisheries Management Plan provides direction for fisheries management in the Aylmer District to the year 2000.

Strategies identified in this plan will be executed through:
(i) the preparation of five year implementation schedules

(ii) programs and projects approved and funded under the MNR annual work planning process

(iii) cooperative programs carried out by the Ministry of Natural Resources and other government agencies

(iv) cooperative CFIP projects with local sportsmen organizations entrepreneurs, private landowners and special interest groups

(v) reviewing and approving work plans and proposals from municipalities, other government agencies and consulting engineers.

The first five year (1987-91) implementation schedule is included with this Plan and is discussed in the next section. While the schedule will be updated annually to maintain a 'running' five year schedule, implementation schedules will not be formally reviewed until 1991 and 1996 at which time they will be subjected to public notice and review, and approval by the District Manager and Regional Director. Any significant alteration or revision of the implementation schedule - during annual updates - or of the fisheries management plan itself, will require public review and senior management approval.

Routine planning and administrative functions are not detailed in the implementation schedule. Similarly, specific enforcement activities are not included as they have already been summarized in a separate enforcement plan for the Aylmer District.

General enforcement and fisheries extension such as enforcing legislation, communications, and encouraging public participation, are listed in the schedule to indicate that these activities are carried out on an ongoing basis. The Aylmer DFMP is intended to provide direction to the fisheries component of the District's law enforcement plan.

The Community Fisheries Involvement Program will continue to play a significant role in District fisheries management. However, specific CFIP projects are not included in the implementation schedule because the frequency with which the public initiates these cannot be

predicted. Nevertheless, the implementation schedule will provide the framework for CFIP projects in the District.

District bait fish management strategies will attempt to increase access to bait fish populations, increase production from under-harvested waters, improve basic management information regarding species biology and habitat requirements, and provide a better understanding of demand for bait fish from District waters.

District management of rare or endangered fish species will focus on preserving existing populations and habitat, and on improving knowledge about these fish in local waters.

The District will cooperate with outside agencies, such as colleges and universities, that wish to initiate research projects and will facilitate such work whenever possible. The District may also initiate experimental management projects to test new management initiatives that may have wide spread impacts.

Annual work plans will be developed from the priorities established in the implementation schedule and will indicate how various tactics will be executed.

General fisheries program priorities for the different categories of bodies of water in the District are as follows:

Lake Erie

Fisheries management activities in the Aylmer District waters of Lake Erie will be consistent with direction provided by the Lake Erie Fisheries Management Committee. In that context, Lake Erie will be managed primarily for its percid community. The dominant sport and commercial fish species associated with this community are walleye, yellow perch, white bass and rainbow smelt (see also Appendix 1). Allowable harvests from Lake Erie waters will be allocated amongst various user groups as prescribed by the Lake Erie Fisheries Management Committee. Aylmer District will manage commercially utilized fish communities to increase desired fish species abundance while ensuring less desired species are harvested to keep their numbers in check.

While localized rainbow trout stocking is being permitted under the auspices of the Community Fisheries Involvement Program (CFIP) to enhance sport fishing opportunities for coldwater species, chinook, coho and pink salmon will not be stocked by Aylmer District for sport or commercial fishing purposes.

The District will attempt to improve the current yield of smelt by recommending commercial fishing quotas which will allow smelt to rebound, by controlling stocking programs to reduce predation, and by developing access to this fishery to facilitate harvesting where possible.

The District will attempt to resolve low current yield of stream salmonids by resource protection and habitat rehabilitation but anglers may have to continue to depend on migratory Lake Erie runs and private sector fishing preserves

for acceptable coldwater sport fishing opportunities.

The District is prepared to strike special advisory committees, made up of representatives of the various interest groups, to resolve user group differences and to continue to work cooperatively with MNR to conserve local fish populations.

Inland Streams

The management of individual streams is based on habitat designation and resident fish communities. However, while the main branches of many rivers have been designated as warmwater habitats these waterways can also be utilized seasonally by migratory cool- (eg. percids) and coldwater (eg. salmonids) fish to reach spawning and nursery habitats in headwater areas. Every effort will be made to increase current yield of preferred sport fish species from existing stream populations. This will involve fish habitat and fish community rehabilitation to improve yield from under-producing waters.

The stocking or transfer of adult fish and the use of upwelling incubation boxes will be considered as rehabilitative tactics. The introduction of alternative sport fish species will also be considered where it is not practicable to mitigate conditions which restrain preferred species production (eg. bass versus trout stocking).

Habitat rehabilitation will be directly pursued under the auspices of CFIP. Indirectly, the District will achieve fish habitat rehabilitation by encouraging land use managers and planners at other agencies to promote best use practices to their clients to control diffuse or non-point pollution of inland watercourses. The District will also develop large scale fisheries habitat restoration projects in urban areas to promote and facilitate the use of sport fishing opportunities from traditionally underutilized yet highly productive watercourses; for example, the North Thames River at the 'Forks' in London.

Increased harvesting of bait fish will be monitored and controlled to ensure that stable populations continue to exist in the District and that these harvests do not impact on other more desirous fishing opportunities. For example, the harvest of bait fish is currently prohibited in 20 coldwater streams to protect salmonids. Further restrictions on bait fish harvests will also be implemented if increased harvests begin to deplete the forage base for sport or commercial species.

Brook trout will receive special consideration. The headwater areas of coldwater streams will receive maximum protection to preserve brook trout habitat by enforcing the Fisheries Act, for example, and by mitigating the impacts of necessary stream alterations. Tactics for preserving existing brook trout populations in these streams include: preventing the stocking of alternative or competitive fish species which may displace brook trout and prohibiting the harvest of bait fish from these streams. Non-consumptive uses of fisheries resources including: fish viewing, live release of

sport fish and some academic research will be especially promoted on inland streams to heighten public awareness.

An extensive stream inventory program will be required to examine unsurveyed waters and to update existing records before sound management strategies for these specific streams can be developed.

Inland Reservoirs, Lakes and Privately Owned Ponds

Management of these waters will be done in accordance with management strategies for connecting streams or rivers and with the cooperation of their owners or managers. Watercourses which support healthy fish communities and which provide fishing opportunities will be conserved.

Water levels in many District reservoirs are controlled by Conservation Authorities. The first priority for many of these reservoirs is flood control and low-flow augmentation. Recreational benefits such as sport fishing are a secondary benefit. Reservoir fish habitat is often not productive because of water quality problems and extreme water level fluctuation and this generally results in reservoirs being under-producing. These waters will be studied to determine where restraints on fish production exist and to devise appropriate management tactics to improve current yields.

Certain Conservation Authority reservoirs can be managed to meet the demand for artificial sport fishing opportunities. These include: Embro, Harrington, Wardsville and Springwater ponds; and Lake Whittaker; where 'put-and-take' rainbow trout stocking occurs.

The bait fish industry may be encouraged to expand into areas which are either underutilized or produce inadequate sport fish to sustain recreational fisheries. Methods of commercially harvesting overabundant or underutilized fish species may also be examined to assist the recovery of more desirous sport fish populations.

The District will review ongoing lake and reservoir water quality monitoring by MOE and Conservation Authorities to ensure that criteria for aquatic biota are maintained.

4.2 IMPLEMENTATION SCHEDULE 1987-1991

The District's fisheries management priority for the next five years will be to protect, maintain, assess and rehabilitate fish populations and habitats (Table 3). Preceding sections of this plan have presented the full range of strategies and tactics which are appropriate for the District. This section now condenses these into a manageable 5-year plan.

Fish populations will be protected primarily through plan review activities and communications to inform the public about fisheries resources and through enforcing existing legislation. Habitat protection will also rely mainly on these tactics. Protection of fish populations and habitat will be a District wide activity and will

focus on existing sport fish populations in coldwater streams and on bodies of water which sustain rare or endangered fish species.

The District will maintain and improve sport fisheries by: enforcing legislation, assisting the Federal Department of Fisheries and Oceans to control sea lamprey, prohibiting bait fishing in watercourses which sustain important coldwater sport fisheries, and installing fishways to expand walleye and trout fishing opportunities created by seasonal migrations in District rivers. Over the next five years the District will focus fisheries maintenance on the main branches of Great Lakes tributaries such as the Thames, Ausauble and Sydenham rivers; and Big Otter, Kettle and Catfish creeks.

Assessment of fish populations will involve user surveys, inventory surveys, and identification of factors limiting fish production. While assessment of Lake Erie fisheries is done by the Lake Erie Fisheries Station, the District will continue to contribute to lake-wide commercial fishery assessment through the Port Observer program in waters fronting Elgin County. The District will also initiate, in cooperation with the Conservation Authorities, long-term use assessment of major inland sport fisheries, on the Thames River and Conservation Authority reservoirs for example. Habitat assessment surveys will identify factors which limit sport fish production in District waters and will be carried out on the priorized basis determined from District stream surveys.

Rehabilitation of fish populations will include fish stocking and mitigation of factors limiting fish production. Fish stocking will include adult walleye transfers (Thames River) and 'put-and-take' rainbow trout stocking (Lake Erie and inland reservoirs) to increase, redistribute and diversify sport fishing opportunities. Habitat rehabilitation will seek to restore original habitat characteristics and will focus on the District's trout streams and on urban sections of the Thames River. Rehabilitation will also be achieved through extension with other agencies and special interest groups especially Conservation Authorities, municipalities, and sportsmens' clubs.

Commercial fishery management will continue to be directed towards modernization. The District will encourage the industry to develop new markets and techniques to more effectively harvest non-traditional and underutilized fish species. The District will also ensure compliance with annual harvest quotas in waters over which it has administrative jurisdiction.

Bait fishing will be maintained at its current level in the District.

Sites which are not specifically identified in the initial (1987-91) implementation schedule may be listed in subsequent implementation schedules (1991 and 1996).

TABLE 3: AYLMER DISTRICT FISHERIES MANAGEMENT PLAN IMPLEMENTATION SCHEDULE 1987 - 1991

STRATEGY and TACTICS	LOCATION(S)
(SF-1) To protect the fish habitat in waters already supporting resident sport fish:	
- enforce legislation pertaining to fish habitat protection consistent with a 'net gain' of fish habitat philosophy	District wide
- liaise with municipalities and other government agencies to ensure that sensitive coldwater streams receive recognition during the plan input and review stages for work in or near natural waters including impoundments, drains and wetlands	District wide
- cooperate with other agencies such as the Ministry of the Environment (MOE) to collect and report information on fish kills and contaminant spills	District wide
- inform and educate the public about the impacts of various land use practices on the aquatic environment by issuing news releases and/or information pamphlets	District wide
- maintain existing stream canopies, wetlands and coldwater sources such as aquifers and springs in headwater areas by controlling tree cutting in these areas	Komoka Creek Caddy Creek Foldens Creek Five Points Cr. Dorchester Swamp Creek Whiting Creek Nairn Creek Duncrief Creek North Branch Cr

TABLE 3 (continued): AYLMER DFMP IMPLEMENTATION SCHEDULE 1987 - 1991

STRATEGY and TACTICS	LOCATION(S)
(SF-2) To maintain and improve existing sport fish populations:	
- enforce fishing regulations to prevent the excessive harvest of local fish populations	District wide
- prevent the introduction or spread of disease into new waters by stocking, or allowing to be stocked, only fish which are disease free according to provincial standards and guidelines	District wide
- encourage the removal of in-stream barriers such as dams and discourage construction of new barriers which limit the movement of fish by enforcing the Lakes and Rivers Improvement Act where appropriate	District wide
- prohibit bait fish harvesting from selected streams to prevent incidental catches of salmonids	Thames River Big Otter Creek South Otter Cr. Catfish Creek Sydenham River Ausauble River
(SF-3) To implement a comprehensive fisheries assessment program to monitor sport fish populations and habitat conditions:	
- cooperate with other agencies such as MOE to collect samples for the sport fish contaminant monitoring program	Thames River
- conduct tagging studies on selected migratory fish species to assess fish movements and habitat utilization	Thames River (walleye)
- encourage sportsmens' clubs and other interested groups to monitor fish habitat conditions in District watercourses, particularly water temperature	Sally's Creek

TABLE 3 (continued): AYLMER DFMP IMPLEMENTATION SCHEDULE 1987 - 1991

STRATEGY and TACTICS	LOCATION(S)
- conduct creel surveys to assess and evaluate survival and harvest of fish stocked in the District	Embro Harrington Springwater L. Whittaker
(SF-4) To monitor exploitation rates of various sport fish species:	
- conduct creel surveys to estimate current use of sport fisheries	Thames River Ausauble River
- encourage conservation authorities to conduct creel surveys on reservoirs within their jurisdiction	Parkhill Springwater Sharon Wildwood Fanshawe Pittock
- encourage local sportsmen to maintain angler diaries to evaluate specific use of particular sport fisheries	Thames River
- encourage local fishing derby organizers to collect and record specific derby harvest and fishing pressure information	Lake Erie Thames River
-encourage Lake Erie charter boat operators to cooperate with the Lake Erie Fisheries Station by maintaining daily logs of sport fish catches and fishing pressure	Port Stanley Port Burwell

TABLE 3 (continued): AYLMER DFMP IMPLEMENTATION SCHEDULE 1987 - 1991

STRATEGY and TACTICS	LOCATION(S)
(SF-5) To rehabilitate degraded sport fish habitat:	
- continue projects to rehabilitate degraded sport fish habitat in lakes and streams	North Thames River in London
- encourage CFIP activities to improve degraded coldwater habitat	as submitted
- conduct a workshop to advise and encourage lead agencies such as the Conservation Authorities and the Ontario Ministry of Agriculture and Food (OMAF) to promote erosion control and drain restoration	1988
(SF-6) To increase sport fish opportunities by redirecting effort to underutilized sport fish species:	
- no tactics at this time	
(SF-7) To increase angling opportunities by creating artificial sport fisheries in selected waters on an interim basis to satisfy local demand or to divert pressure from natural sport fish populations:	
- purchase disease free rainbow trout from the private sector to plant in public waters for 'put-and-take' type fishing	Embro Pond Harrington Pond Wardsville Pond Lake Whittaker Springwater Pd.
(SF-8) To supplement, increase and diversify natural sport fishing opportunities with fish plantings according to provincial standards and guidelines:	
- approve CFIP upwelling incubation box facilities, for salmonid production, and fish transfer projects, primarily for bass and crappie	as submitted

TABLE 3 (continued): AYLMER DFMP IMPLEMENTATION SCHEDULE 1987 - 1991

STRATEGY and TACTICS	LOCATION(S)
- transplant adult fish to selected waters primarily to establish self-sustaining populations of walleye or bass	Thames River
(SF-9) To encourage public participation in local sport fisheries management:	
- encourage public involvement in large scale fisheries restoration projects, such as the London Urban Fisheries Program, to develop partnerships with specific user groups interested in sharing stewardship of local fisheries resources	Thames River
- promote participation in CFIP amongst local sportsmens' clubs and other conservation oriented groups	District wide
- conduct workshops to publicly review completed fisheries projects	1991
(SF-10) To inform non-consumptive users of existing fish viewing opportunities:	
- prepare and distribute information pamphlets or news releases about seasonal opportunities to view fish, during spawning migrations for example	Thames River Big Otter Creek Kettle Creek
- make provisions for fish viewing when designing fishways	Thames River (Hunt dam)
(SF-11) To increase public sport fishing access to Lake Erie and inland waters:	
- encourage landowners to provide public fishing access by entering into agreements with MNR to indemnify them against liabilities arising from such action	Thames River

TABLE 3 (continued): AYLMER DFMP IMPLEMENTATION SCHEDULE 1987 - 1991

STRATEGY and TACTICS	LOCATION(S)
- encourage entrepreneurs and other agencies, eg. municipalities, to develop revenue generating access points, eg. boat launches	Thames River Port Stanley Port Burwell Port Glasgow
- inform and educate the public about available access points by issuing news releases or information pamphlets	District wide
- encourage sportsmens' clubs to initiate landowner negotiations for permitted access over private lands to satisfy localized sport fishing requirements	District wide
(SF-12) To mitigate the loss of sport fish habitat because of water level fluctuations in reservoirs:	
- advise agencies, such as the City of London, that regulate the timing of low water flow augmentation for sewage dilution not to interrupt critical fish spawning and hatching periods	Springwater dam Fanshawe dam Pittock dam Wildwood dam Parkhill dam
- contour floodplains and reservoir shorelines to provide experimental spawning and nursery habitats for selected fish species by creating subimpoundments for controlled water retention during draw downs	Pittock Resvr. (pike)
- supply operating agencies, such as Conservation Authorities, with information to prevent scheduled water related maintenance and development from impacting on spawning and hatching periods for selected fish species	1990 workshop and as notified

TABLE 3 (continued): AYLMER DFMP IMPLEMENTATION SCHEDULE 1987 - 1991

STRATEGY and TACTICS	LOCATION(S)
(CF-1) To maintain commercial fishing on Lake Erie to harvest prescribed annual allowable yields of fish:	
- regulate the harvest by assigning yearly quotas	Lake Erie
- continue to limit further entry into the fishery to ensure the continued viability of businesses and to prevent overharvesting of local fish stocks	Lake Erie
- encourage commercial fishermen to continue to work with MNR and special interest groups to resolve resource allocation conflicts by facilitating meetings between all concerned	Lake Erie
(CF-2) To conserve and protect Lake Erie commercial fish communities:	
- enforce fisheries regulations to ensure compliance with quotas and accurate reporting of catches	Lake Erie
- cooperate with MOE by collecting and reporting information on fish kills and contaminant spills in Lake Erie tributaries	Lake Erie (Strategy 1)
- maintain fish habitat by discouraging Lake Erie shoreline development projects which lead to loss of fish habitat and by promoting fish habitat rehabilitation and enhancement during plan review exercises	as submitted
(CF-3) To develop fisheries assessment programs to monitor commercial fish populations:	
- no tactics at this time	
(CF-4) To promote CFIP to the commercial fish industry:	
- no tactics at this time	

TABLE 3 (continued): AYLMER DFMP IMPLEMENTATION SCHEDULE 1987 - 1991

STRATEGY and TACTICS	LOCATION(S)
(BF-1) To protect existing bait fish populations:	
- enforce regulations for reporting harvests and sales of bait fish	District wide
- limit entry to this fishery where necessary to prevent legal over-harvesting	Middlesex and Oxford Co.'s
(BF-2) To develop bait fish assessment programs to monitor bait fish populations:	
- no tactics at this time	
(BF-3) To optimize the current harvesting of bait fish from inland waters:	
- no tactics at this time	
(BF-4) To increase the availability of bait fish for sale to anglers:	
- no tactics at this time	

TABLE 3 (continued): AYLMER DFMP IMPLEMENTATION SCHEDULE 1987 - 1991

STRATEGY and TACTICS	LOCATION(S)
(R/E-1) To protect the habitat of rare or endangered fish species:	
- enforce legislation pertaining to fish habitat protection such as the Fisheries Act and the Endangered Species Act	District wide
- support scientific research into habitat requirements for life stages of rare or endangered fish species by authorizing field work and data collection as appropriate	upon request
(R/E-2) To preserve existing populations of rare or endangered fish species:	
- prevent the harvest of rare or endangered fish species by enforcing legislation such as the Endangered Species Act and by not permitting bait fish harvesting from waters containing rare or endangered fish species	District wide
- support scientific research into fish species distribution by authorizing specimen collection as appropriate	upon request
(R/E-3) To inform and educate the public about the status of rare or endangered fish species:	
- heighten public awareness about rare or endangered fish species by distributing pamphlets and posters describing these species	District wide (pending production by other agencies or special interest groups)

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GLOSSARY

ANGLING OPPORTUNITY

* A measure of the potential use a resource can sustain. An angling opportunity may be defined as one fishing trip not exceeding one day in length. See also 'OCCASION'.

ARTIFICIAL FISHERY

* A fishery which is artificially maintained through plantings of hatchery reared fish, for example, to provide sport fishing opportunities.

BAIT FISH

* Any member of the minnow family Cyprinidae, except carp and goldfish; the mudminnow family Umbridae; the stickleback family Gasterosteidae; the trout-perch family Percopsidae; the sculpin family Cottidae; the genus Leucichtyhys of the whitefish family Coregonidae and the darter sub family Etheostomatinae.

'COARSE' (UNDERUTILIZED, OVERABUNDANT) FISH

* Fish from the families Lepisosteidae (gars), Amiidae (bowfin or dogfish), Ictaluridae (catfish and bullheads), Gadidae (burbot), Cyprinidae (carp), Anquillidae (eel), Sciaenidae (freshwater drum or sheepshead), Osmeridae (smelt) and Catostomidae (suckers and redhorses or mullet). There are fewer restrictions controlling harvesting of these often abundant species.

COLDWATER FISH COMMUNITY

* Fish populations comprised primarily of the families Salmonidae (trout, salmon and whitefish), Gadidae (burbot) and Clupeidae (herrings).

COMMERCIAL FISH

* Those species harvested from Lake Erie waters under authority of a licence and marketed for human consumption. The most common commercial fish species in the Aylmer District are yellow perch, walleye and rainbow smelt.

COOLWATER FISH COMMUNITY

* Fish populations comprised primarily of the families Esocidae (pike and muskellunge) and Percidae (perch and walleye). These have been combined with warmwater fish species for the purposes of this Plan.

CURRENT FISHERIES YIELD

* The current fisheries yield equals estimated potential fisheries yield restrained by existing circumstances such as degraded habitat. See also 'POTENTIAL YIELD'.

CURRENT USE

* The estimated present harvest or number of fishing occasions. See also 'PROJECTED USE'.

ENHANCEMENT

* This term describes efforts to improve fish habitat or fisheries beyond their original status to meet demands for fishing opportunities. See also 'REHABILITATION'.

EXOTIC FISH SPECIES

* A fish species which is neither native nor has become naturalized in waters within the Province of Ontario; a recent invader which has the potential to disrupt existing fish communities.

FISH COMMUNITY

* A combination of different fish species living and interacting together in the same body of water.

INDIGENOUS FISH SPECIES

* The native fish species which originally inhabited a body of water. The walleye is one of the indigenous fish species of Ontario.

NATURALIZED FISH SPECIES

* A fish species which was not indigenous to a particular body of water but was introduced and has become established through natural reproduction. Rainbow trout and brown trout have become naturalized in Ontario.

OBJECTIVE

* A quantifiable and attainable condition which is to be achieved.

OCCASION

* A measure of actual resource use. See also 'ANGLING OPPORTUNITY'.

PACIFIC SALMON

* Pacific salmon includes coho salmon, chinook salmon, pink salmon and any member of the genus Oncorhynchus, other than rainbow trout.

POTENTIAL YIELD

* A theoretical estimate of the ability of a body of water to naturally produce fish biomass on a sustained basis. Similar terms include maximum sustainable yield, maximum equilibrium yield and theoretical yield. A ceiling used to assess current yield levels and measured in kg/yr for a defined area. See also 'ESTIMATED FISHERIES YIELD'.

PROJECTED USE

* An estimate of anticipated harvest or number of fishing occasions at a future time. For example, the fish harvest in the year 2000. See also 'CURRENT USE'.

REHABILITATION

* This term may be applied to both fish populations and fish habitat. In both instances rehabilitation denotes efforts to restore a degraded or stressed situation to its original condition. See also 'ENHANCEMENT'.

SOUTHERN ONTARIO

* The southern Ontario planning region includes the following districts: Algonquin Park, Aylmer, Bancroft, Bracebridge, Brockville, Cambridge, Carleton Place, Chatham, Cornwall, Huronia, Lindsay, Maple, Minden, Napanee, Niagara, Owen Sound, Parry Sound, Pembroke, Simcoe, Tweed and Wingham.

SPORT FISH

* Fish species which are sought for non-commercial purposes and

may legally be taken by angling or by means of spear, dip net, bait fish trap, seine net or bow and arrow where permitted in accordance with the Ontario Fishery Regulations. In the Aylmer District this usually includes fish from the families Salmonidae (trout and salmon), Percidae (walleye and yellow perch), Esocidae (pike), Centrarchidae (sunfish and bass), Ictaluriade (catfish), Catostomidae (sucker) and Cyprinidae (carp and minnows).

STOCK

* A species group, or population, of fish which maintains and renews itself over time and may be identified by distinct genetic or behaviourial traits.

STRATEGY

* Broad measures or policies designed to achieve a stated objective.

TACTIC

* A procedure to be implemented to achieve one or more strategies.

TARGET

* A quantified end to be achieved or completed by a specific date. Targets provide a means to measure achievement of an objective and to review the effectiveness of strategies and tactics.

UNDERPRODUCING WATERS

* Lakes and/or streams which exhibit restrained fish production and are not producing fish at their estimated biological potential. This is usually due to some ecological imbalance such as habitat degradation.

UNDERUTILIZED, UNDER-HARVESTED WATERS

* Bodies of water which fail to attract fishing pressure due to angler preferences, difficult or non-existent access, fish community, etc. These waters are most often characterized by stunted fish populations.

WARMWATER FISH COMMUNITY

* Fish populations comprised primarily of the family Centrarchidae (sunfish - includes large- and smallmouth bass, and crappies). Also refers to coolwater fish communities (percids, esocids) within the context of this plan.

VIEWING OPPORTUNITY

* A measure to describe the number of times it would be possible to see a resource or a facility in a given time period. A viewing opportunity is considered a non-consumptive use of the resource and is measured in viewing occasions per day.

APPENDIX 1: IMPORTANT FISH SPECIES LISTED ACCORDING TO THEIR FISHERIES, AYLMER DISTRICT

FISHERIES	SPECIES (COMMON NAMES)		
Bait Fish	creek chub	stickleback	
	emerald shiner	sucker	
	spottail shiner		
Commercial Fish	alewife	gizzard shad	sucker
	bowfin	lake herring	sunfish
	bullhead	lake trout	white bass
	burbot	lake whitefish	white perch
	carp	northern pike	yellow perch
	channel catfish	rainbow smelt	walleye/pickerel
	crappie	rock bass	
	eel	sauger	
	freshwater drum	sturgeon	
Sport Fish[1]	black crappie	lake trout	smallmouth bass
	bluegill	largemouth bass	sunfish
	brook trout	northern pike	white crappie
	brown trout	pacific salmon[2]	white sucker
	bullhead	pumpkinseed	white perch
	carp	rainbow smelt	yellow perch
	channel catfish	rainbow trout	walleye/pickerel
	freshwater drum	river chub	
	goldeye	rock bass	

1. sport fish includes game fish and some commercial fish.

2. pacific salmon includes chinook, coho and pink salmon.

APPENDIX 2: FISH COMMUNITIES AND MANAGEMENT ACTIVITIES FOR INLAND RESERVOIRS, LAKES AND PRIVATELY OWNED PONDS IN AYLMER DISTRICT

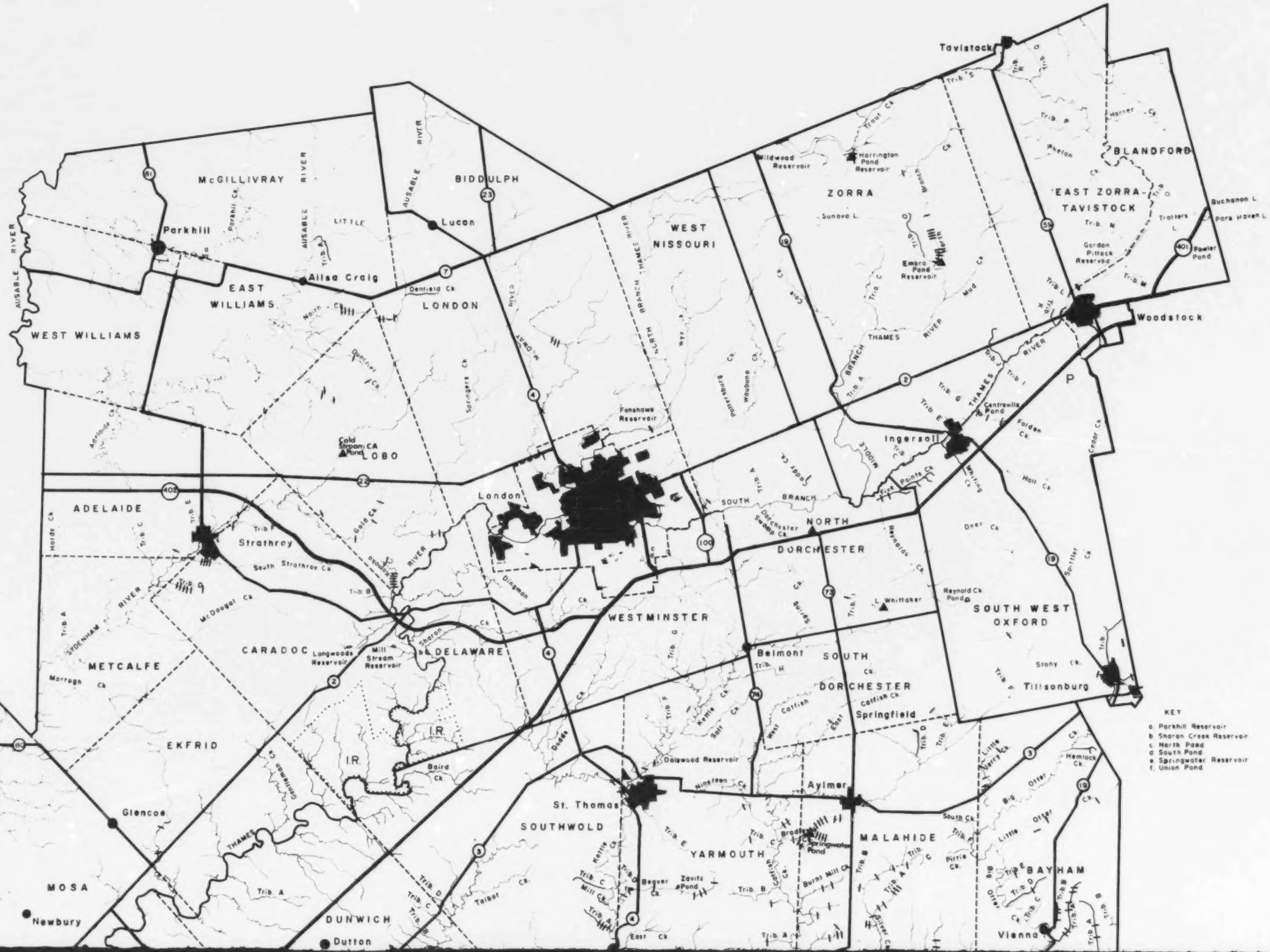
CA and WATERSHED CODE	LAKES-RESERVOIRS	TOWNSHIP	RESIDENT FISH COMMUNITY	MANAGEMENT ACTIVITIES
Ausable River 2FF-04	Parkhill Reservoir	W. Williams	l&sm.bass y.perch carp catfish sucker panfish	Work with landowner to initiate rehabilitation to enhance warmwater fishery. Bass and perch given priority. Investigate/minimize the effects of water fluctuations.
Grand River 2G8-05	Maple Lake	Blandford-Blenheim	lm.bass y.perch panfish	Determine strategies after inventory study.
	Fowlers Pond	Blandford-Blenheim	lm.bass n.pike y.perch	Determine strategies after inventory study.
	Buchanan Lake	Blandford-Blenheim	lm.bass n.pike y.perch catfish panfish	Determine strategies after inventory study.
	Trotters Lake	Blandford-Blenheim	not available	Work with landowner. Determine strategies after inventory study.
Kettle Creek 2GC-02	Lake Whittaker	N.Dorchester	l&sm.bass n.pike y.perch catfish panfish	Work with landowner to initiate habitat rehabilitation to restore coldwater fishery. Establish an artificial rainbow trout fishery.
	St. Thomas Waterworks Reservoir	Yarmouth	l&sm.bass n.pike y.perch carp sucker panfish	Work with landowner to initiate habitat rehabilitation to enhance warmwater fishery. Bass and pike given priority.

	Union Pond	Yarmouth	l&sm.bass catfish carp panfish	Work with landowner to restore coldwater fishery. Determine strategies after inventory study.
	Zavitz Pond	Yarmouth	sm.bass catfish sucker panfish	Work with landowner to restore coldwater habitat.
Catfish Creek 2GC-03	Springwater Pond	Malahide	lm.bass catfish carp sucker panfish	Work with landowner to initiate rehabilitation to enhance warmwater fishery. Bass given priority. Investigate/minimize effects of water fluctuations.
Thames River 2GD-01	Centreville Pond	E.Zorra-Tavistock	y.perch panfish	Work with landowner to restore coldwater fishery. Determine strategies after inventory study.
	Gordon Pittock Reservoir	E.Zorra-Tavistock	l&sm.bass n.pike y. perch catfish sucker panfish	Work with landowner to maintain rehabilitation to enhance warmwater fishery. Bass and pike given priority; management to include perch and carp. Investigate/minimize water fluctuations. Consider commercial harvest of noxious or underutilized species. Provide winter sport fishing opportunities.
2GD-3	Embro Pond	Zorra	rainbow trout	Work with landowner to enhance coldwater habitat. Maintain artificial rainbow trout fishery.
	Sunova Lake	Zorra	lm.bass panfish	Work with landowner. Determine strategies after inventory study.

2GD-4	Reynolds Creek Pond	S.W. Oxford	y.perch sucker	Work with landowner to restore coldwater fishery. Determine strategies after inventory study.
2GD-5	Fanshawe Lake	London	l&sm.bass n.pike y.perch catfish carp	Work with landowner to maintain rehabilitation to enhance resident warmwater fishery. Bass and pike priority; management to include perch and carp. Investigate/minimize the effects of water fluctuations. Consider commercial harvest of noxious or underutilized species Provide winter sport fishing opportunities.
2GD-8	Wildwood Lake	Zorra	l&sm.bass y.perch catfish carp sucker panfish	Work with landowner to maintain rehabilitation to enhance warmwater fishery. Bass given priority; management to include perch and catfish. Investigate/ minimize effects of water fluctuations. Consider commercial harvest of noxious or underutilized species Provide winter sport fishing opportunities.
	Harrington Pond	Zorra	rainbow trout	Work with landowner to enhance coldwater habitat. Maintain artificial rainbow trout fishery.
2GE-1	Big Bend Pond	Mosa	rainbow trout	Work with landowner to maintain artificial rainbow trout fishery.
	Longwoods Reservoir	Caradoc	panfish	Work with landowner to initiate habitat rehabilitation to enhance warmwater fishery.

	Mill Stream Reservoir	Lobo	n.pike catfish carp sucker panfish	Work with landowner to initiate habitat rehabilitation to enhance warmwater fishery. Bass given priority.
	Sharon Creek Reservoir	Delaware	catfish panfish	Work with landowner to initiate habitat rehabilitation to enhance warmwater fishery.
2GE-6	Pond Mills (North Pond)	Westminster	sm.bass n.pike panfish	Work with landowner to restore coldwater habitat.
	Pond Mills (South Pond)	Westminster	lm.bass panfish	Work with landowner to restore coldwater habitat.

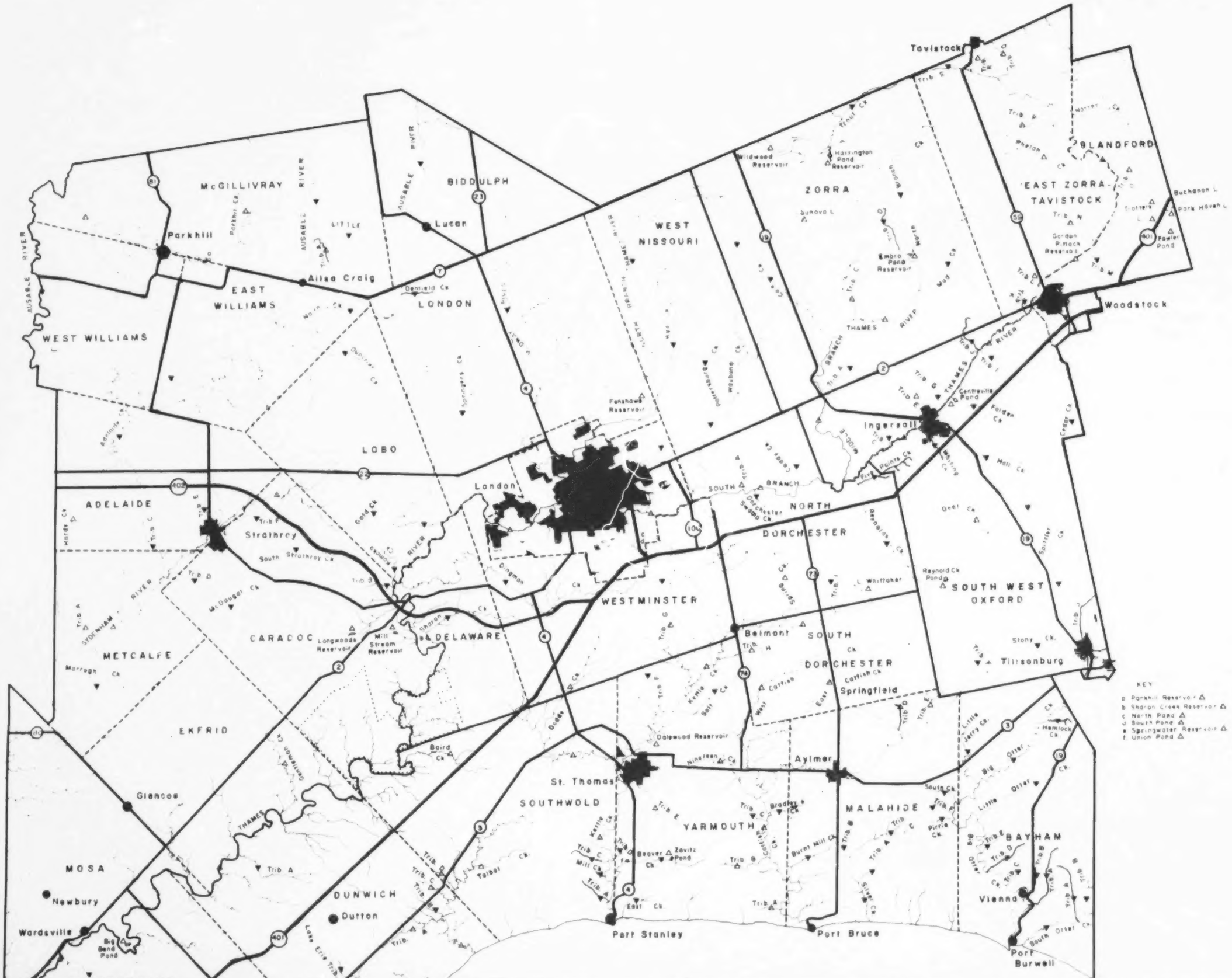
MAP 1: BACKGROUND INFORMATION, AYLMER DISTRICT



LEGEND

- Dam
- ▲ Stocked Pond
- ★ Commercial Fishing Area
- ☆ Commercial Operators Serving Anglers
- I.R. Indian Reserve
- P Provincial Park

MAP 2: WATERBODIES, AYLMER DISTRICT



LEGEND

△ Warm - 21°C or more

▼ Cold - Less than 21°C